

The Economics of Cash Shortage

Patrick Conway

Cash shortages in the economies of the former Soviet Union are manifestations of financial disintermediation: the banking sector is unable to attract enough voluntary deposits. Printing more money will only stimulate higher inflation. Raising nominal interest rates is a more appropriate policy response.



Summary findings

Many economies of the former Soviet Union have experienced cash shortages: people with demand and savings deposits in the banking system are unable to convert them into currency. Usually this is attributed to the common use of the ruble.

Conway argues otherwise. According to him:

- Cash shortages are manifestations of financial disintermediation: the banking sector is unable to attract enough voluntary deposits.
- Cash shortages allow the government to hold inflationary pressures in check.
- Solutions to the cash shortage problems that rely on printing new currency will lead to accelerating

inflation. More appropriate solutions (increasing the nominal interest rate, for example) involve reversing the economic incentives to financial disintermediation.

Excess demands for cash reflect conditions in financial markets. The phenomenon of cash shortage is related to the concept of shallow formal financial markets. This shallowness is recent in the former Soviet Union. The burst of inflation in early 1992 removed the "ruble overhang" and greatly reduced all indicators of financial depth. Continuing shallowness is a direct consequence of financial disintermediation because of negative real interest rates.

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Comments are welcome.

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Cash shortage has been observed in many of the economies of the former Soviet Union. It is defined here to be the inability of actors within the economy to convert other (usually liquid) financial assets into currency: the specific financial assets in question are demand and saving deposits with the banking system. Although its incidence is often attributed to the common use of the ruble, I demonstrate in this paper that there are behavioral causes of the phenomenon.

Three propositions summarize the argumentation of this paper. First, cash shortages are manifestations of financial disintermediation: the banking sector is unable to attract sufficient deposits voluntarily. Second, cash shortages allow the government to hold inflationary pressure in check. Third, solutions to the cash shortage that rely upon printing currency will lead to accelerating inflation. More appropriate solutions involve reversing the economic incentives to financial disintermediation.

The next section illustrates these three propositions in a simple model. Sections II through IV provide proofs of the three propositions above. Section V includes a summary and extensions of this analysis.

II. An Illustration of the Causes and Effects of Cash Shortage.

The problem of cash shortage can be seen most transparently in a schematic including the government, the banking sector, state enterprises and households. Consider the simplified framework of Figure 1.¹

- The government begins from budgetary balance. It then purchases a final good from the state enterprise with accounting credits of real value q . These expenditures are not offset by tax revenues. It does not re-sell the product.
- The state enterprise pays out a fraction z of its receipts in wages to households, and a fraction $(1-z)$ in payment to other factors of production in the state enterprise sector.
- The state enterprise trades the real value qz in accounting credits to the banking system for the equivalent value in currency, and pays that amount to the households.
- Households save a fraction x of this wage income in deposits with the banking system; they save as well the real fraction d from their private-sector income with the banking system. The banking system credits their accounts with interest at the nominal rate i .
- There is initially zero inflation.

There is a unique equilibrium for this specification of the flow of funds, as noted in Figure 2. Incremental government purchases are measured along the horizontal axis, while real wages and real deposits are measured along the vertical axis. The line from the origin indicates wage payments occasioned by the government purchases. The shallower line with positive intercept measures the deposits of households in the banking sector. There is a single level of government expenditure q^* consistent with equilibrium. This equilibrium represents a government budget deficit financed through private saving. The cash flows from households to banking system to state enterprises and back to households represent the monetary counterpart to the real financing flows.

Government expenditure in excess of q^* (for example, q^0) leads to greater real wage payouts

¹ Other factors may save only a portion of their income and consume the rest; that will not change the qualitative nature of the story. Payment to "other factors" may include taxes paid; that also will not change the story. I maintain the notion that wages must be paid in currency for this illustration, but will demonstrate later that this is an equilibrium feature of the model.

than to deposits by households. There will be a cash shortage, with state enterprises unable to pay wages in currency because the banking system cannot provide that cash. The enterprises have deposited these credits with the banking system, but the banks cannot convert those deposits to cash. This example indicates that the shortfall in household deposits in the formal financial system is the proximate cause of the cash shortage, and thus illustrates the first proposition of this paper.

There are two possible responses to cash shortage: currency emission, or rationing of cash payments. The first eliminates the cash shortage, while the second adjusts the payments scheme to reflect the shortage and transmits the cash shortage to the households. Currency emission will be inflationary, while adjusting the payments scheme will be less so. There are two payments adjustments observed in cash shortage countries: either the state enterprise runs arrears in wages, or it credits the households' accounts at the banking system for the sum of the shortfall in wages. If the banking system then places restrictions on withdrawals (which it must, given the shortage of cash), the two variants have the same result: households are forced to save the amount of the cash shortage. In Figure 2, if government expenditure is q^0 and the wage shortfall is translated into banking deposits then household saving has risen by the amount of the shortfall. As household saving offsets the government deficit, there is no inflationary pressure.

Inflation is the result of an excess demand for goods and services. Currency emission will solve the cash shortage in the current period. If the banking system issues currency with real value $[qz(1-x)-d]$ it will have sufficient cash to cover enterprise transactions. However, unless the households are willing simply to hold this currency as saving, this currency issuance will lead to positive inflation in each period. The excess demand of the government is no longer completely offset by private saving, and the prices of goods and services will be bid up. This illustrates the second proposition: adjusting the payments mechanism in response to cash shortage is less inflationary than is currency emission.

Currency emission is a temporary solution, and must be repeated each period. It must in fact be intensified in each period if the households have alternative financial assets that provide a hedge against inflation. In Figure 3 I consider the situation in Figure 2 but introduce the impact of the positive inflation rate. Since the banking deposit is not indexed against inflation, the household's portfolio decision will be adapted. The level d of deposits from private activity and the share x of wage income deposited with the banks will both fall (to d' and x' , respectively). This implies a still larger non-financed budget deficit and a larger need for currency emission in this period, and inflation will rise. As the third proposition states, currency emission will lead to an acceleration of inflation. The fundamental imbalance in cash flows is due to the budget deficit and the incentives for households to save, and these have not been remedied.

The economics of cash shortage are clear in this illustration. However, household behavior is treated in a simplistic fashion. I assume that households must take wage payments in cash. Only two financial assets are considered, currency and deposits. The values of x and d are treated as parametric, when they are in fact the outcome of a portfolio decision process. The following sections provide a more general analysis.

III. Cash Shortages are Manifestations of Financial Disintermediation.

I maintain the notation of the previous section, but provide a more precise representation of household saving and portfolio allocation behavior. Households are an integral link in the cash flow

within each economy. I assume that they have well-defined demands over three financial assets defined in real terms: currency (H), bank deposits (D) and foreign exchange $((e/P)F$, with F defined in foreign exchange). The returns on these assets, as summarized by the nominal interest rate (i), the inflation rate (π) and the nominal exchange rate (e) are exogenous to the household. For given level of real household transactions (y) the household prefers to allocate its current real wealth (ω) among these three assets according to the following system of equations.²

$$\begin{array}{lll}
 (1) & H^d = \alpha(i, \pi, y) \omega & \alpha_i < 0, \alpha_\pi < 0, \alpha_y > 0 \\
 (2) & D^d = \beta(i, \pi, y) \omega & \beta_i > 0, \beta_\pi < 0, \beta_y < 0 \\
 (3) & (e/P)F^d = \gamma(i, \pi) \omega & \gamma_i < 0, \gamma_\pi > 0 \\
 (4) & \omega = H^d + D^d + (e/P)F^d & \alpha_i + \beta_i + \gamma_i = 0, \alpha_\pi + \beta_\pi + \gamma_\pi = 0, \alpha_y + \beta_y = 0 \\
 (5) & \dot{e} = \delta \pi & 0 \leq \delta \leq 1
 \end{array}$$

Holding foreign currency serves as a partial hedge against inflation through the depreciation of e indicated in (5), implying the pattern of partial derivatives of asset demands with respect to inflation cited. Note that the demand for currency reflects both saving and transactions motives.³ The stock of real wealth ω is augmented by private saving and interest payments, as will be discussed below.

The supplies of currency and foreign exchange (H^s , F^s) are fixed at any point in time, while the ability of the bank to accept deposits is a function of the uses to which those deposits can be put. I define a benchmark in which the government's financing requirement from deposits is equal to the excess expenditure of the government minus its real receipts from the inflation tax at the specified π . Equilibrium holdings of assets are those in which supplies equal desired demands at current values of i, π , P and e.

Consider as the benchmark the values of i, π , P and Ω that support notional equilibrium for each asset. Figure 4 illustrates those values of i and π consistent with equilibrium in currency holdings (HH) and deposit holdings (DD).⁴ Highlighted values i^* and π^* are consistent with equilibrium in all three markets.⁵ The figure also illustrates the outcomes possible should the interest rate and inflation take on other values. These designate patterns of excess demands for currency and deposits as noted in the diagram. For given exchange rate, interest rate and inflation rate any location in the figure could be observed: the indicated excess demands by Walras' Law are offset by the excess demand in the foreign exchange market.

The term "cash shortage" can be attributed to two different phenomena in these markets. First, households can experience an excess demand for cash. Households will then be willing to hold additional currency should it be available for its saving and transactions needs. Second, the banking system can experience a cash shortage if household demand for deposits provides insufficient currency

² The transactions demand for foreign currency is excluded for simplicity, but its exclusion does not affect the central results of this paper.

³ This lock-step link between exchange rate depreciation and inflation will be removed below.

⁴ The appendix provides a mathematical derivation of these curves and their relative slopes.

⁵ The third market, in foreign exchange, is represented through application of Walras' Law.

to meet government expenditure needs: i.e., if there is an "excess supply" of deposits. This unwillingness to hold deposits is not due to custom or history, but to the unattractiveness of holding an excess share of wealth in the form of deposits.

In Figure 4 these two forms of cash shortage are represented by different (though overlapping) regions in (i, π) space. The first form, cash shortages of the households, is represented by values of i and π to the left of the HH curve. The second form, cash shortages experienced by the banking system, is represented by values of i and π to the right of the DD curve. Point A represents a situation of cash shortage for both households and the banking system: excess demand for currency by households, a demand for deposits by households that does not meet the government's currency requirements, and an implied ambiguous position in the foreign exchange market. Point B represents the household's excess demands for both currency and deposits: the banking system would not suffer a shortage of currency in this instance.⁶

If financial disintermediation is defined as the inability of the banking system to satisfy the demands to convert deposits into currency, then the area to the right of the DD curve is characterized by financial disintermediation. This will coincide with the second form of cash shortage: the shortage to the banking system.

The first proposition of this paper is that cash shortages are manifestations of financial disintermediation. The preceding argument has demonstrated this in a trivial way — a "proof by definition". The crucial feature of this argument has been that the cash shortage to the banking system has not been assumed, or attributed to history or custom: it is the outcome of household decisions given existing interest and inflation rates.

The historical record in the former Soviet Union as provided in Conway (1994) and summarized in Table 1 illustrates that the cash shortages observed there were initially those of the banking system: wage and pension arrears existed prior to shortages of cash observed in household transactions. However, in many of the countries the two coincided: the banking system's cash shortage coincided with a cash shortage of the households (as at point A in Figure 4). Was this a likely outcome?

Although the currency and deposit markets are closely regulated in these countries, the informal foreign exchange market has been quite liberal; the exchange rate has responded to eliminate excess supplies and demands in the market. Incorporating the assumption that there is market balance in foreign exchange leads to removal of equation (5) and a restriction on the observed equilibria in Figure 4.⁷ They will lie on the curve denoted FXE and illustrated in Figure 5, with the

⁶ The implied excess supply of foreign exchange implies an appreciation of the currency relative to foreign exchange in this instance.

⁷ There is not a restriction upon the (i, π) pair, but upon each pair's relationship to the HH and DD curves. For example, when there is excess demand for foreign exchange the exchange rate will depreciate. This will raise real wealth in aggregate and cause a shift in both deposit and currency demands. The resulting configuration will be as described in Figure 5 for any (i, π) pair — both HH and DD curves will either lie above, or both below, the pair (unless the economy is in notional equilibrium at the intersection of the two). The appendix provides a mathematical analysis of excess

HH and DD curves shifting in response to exchange-rate movements. With these (i, π) pairs, any excess demand for currency is offset by an excess supply of deposits by Walras' Law. The banking system's cash shortage will thus coincide with the household's cash shortage. Financial disintermediation is coincident with an excess demand for cash among households as a generalized cash shortage afflicts the economy.

III. Cash Shortages Allow the Government to Control Inflationary Pressures.

The preceding analysis described a static, constant-inflation, equilibrium in the financial markets. Inflation is not exogenous to the cash-shortage problem, however, but is susceptible to manipulation by the government's response to cash shortage.⁸

Inflation is determined by the excess demands for goods within the economy. In the present framework, excess demand can be represented by the non-financed budget deficit. The government's net expenditures q are deposited with the banking system by the state enterprises while the banking system pays out interest on existing deposits. The banking system then converts this excess expenditure into increased banking-system liabilities, as in (6).⁹ Price inflation is modeled in equation (7) as a tatonnement process in excess demand. The budget deficit $(q + iD)$ can be financed either by households through private saving (increased holdings of currency or deposits) or through an inflation tax with parameter ϕ converting excess demand into price inflation. Use of (6) and the portfolio allocation of private saving yields the inflation equation (7').

$$(6) \quad q + iD = \Delta H + \Delta D$$

$$(7) \quad \pi = (1/\phi)(q + iD - s)$$

$$(7') \quad \pi = (1/\phi)([\Delta H - \Delta H^e] + [\Delta D - \Delta D^e])$$

Inflation is rising, *ceteris paribus*, in increased excess stocks of either currency or deposits. This is, however, too simplistic. For the economies of the former Soviet republics, drafts on deposits are not in wide use as means of exchange, and so an increment to deposits is not as inflationary as an increment to currency holdings if the convertibility of deposits is limited.

I represent this through the introduction of a convertibility coefficient χ ($0 \leq \chi \leq 1$) to the inflation equation. χ can be thought of as the probability that an individual can convert deposits to currency at any time; it can also be considered the discount at which deposits are traded for currency

demands and supplies.

⁸ Thanks to Daniela Gressani for suggesting this line of reasoning.

⁹ Foreign borrowing and purchase of goods to meet excess demand is excluded from consideration, but would be a straightforward extension of the analysis here.

on the thin secondary markets which exist.¹⁰

$$(7'') \quad \pi = (1/\phi)([\Delta H - \Delta H^d] + \chi[\Delta D - \Delta D^d])$$

The government can then manipulate the degree of inflation stemming from a given budget deficit by increasing the reliance on deposit creation for financing. The impact on inflation of an incremental shift from currency emission to deposit creation is

$$\partial\pi/\partial D|_{\Delta H = -\Delta D} = (1/\phi)(\chi - 1)$$

Inflation is reduced through this shift in mode of finance. It occurs because either there is forced saving through household holding of deposits in excess of desired quantities, or because the deposits have been revalued for sale on the secondary market and have yielded less purchasing power for today's expenditures.¹¹ This will also have secondary effects through its impact on desired holdings of assets; consideration of these is postponed to the next section.

The second proposition of this paper is that the government will encourage the cash shortage to limit inflation. The analysis above demonstrates that a government that induces holdings of deposits in excess of desired holdings will reduce its inflation rate. These forced deposits are precisely the outcome of cash shortage in the previous section. The government by accepting cash shortage and imposing payment through non-convertible deposits has forced saving and reduced inflation. The alternative, the emission of currency in financing the budget deficit, has greater inflationary effects. As the following section demonstrates, this inflation may be accelerating as well.

IV. Currency Emission in Response to a Cash Shortage will Lead to Accelerating Inflation.

A cash shortage, as outlined in section II, is an excess demand for currency by households and/or the banking system. An obvious policy response is currency emission to satisfy that excess demand. In this section I discuss the final proposition of the paper: such a strategy will lead to increasing (and accelerating) inflation. Other policies that reverse the financial disintermediation will not have that inflationary effect.

Currency emission will be undertaken as a swap of currency for deposits in asset supply. Asset demand will evolve over time in accordance with the behavioral equations (1) and (2). Equations (8) and (9) are derived through total differentiation of those, holding y constant. Real wealth ω is itself a function of inflation, exchange rate depreciation and saving as indicated in

¹⁰ There are much deeper secondary markets for exchanging both currency and deposits for foreign exchange. As Table 2 indicates, in these the exchange rate of deposits per unit of foreign exchange is much higher than the analogous rate for currency. This disparity also represents the discount χ for deposits. If these markets were open to all actors then the problems of rationing could be remedied; however, they are typically limited to banks and large corporations.

¹¹ Purchasing power remains for the individual who exchanged his currency, but that individual as well is unable to convert the deposits into currency.

equation (10). Real saving has both desired (s^*) and forced components, as indicated in equation (11).¹² Substitution of (8), (9), (10) and (11) into (7'), use of the swap identity $\Delta H = -\Delta D$ and rearrangement of terms yields a differential equation in inflation presented in equation (12).

$$(8) \quad dH^d = \alpha(i, \pi, y) d\omega + \omega\alpha_r d\pi + \omega\alpha_i di$$

$$(9) \quad dD^d = \beta(i, \pi, y) d\omega + \omega\beta_r d\pi + \omega\beta_i di$$

$$(10) \quad d\omega = s + \hat{e} (c/P)F - \pi\omega$$

$$(11) \quad s = s^* + (1-\chi)(\Delta D - \Delta D^d)$$

$$(12) \quad \omega d\pi = (-1/(\alpha_r + \chi\beta_r)) [(\phi + (\alpha + \chi\beta)\omega) \pi - \omega(\alpha_i + \chi\beta_i) di \\ - (\alpha + \chi\beta) (s^* + (1-\chi)(\Delta D - \Delta D^d) + \hat{e} (c/P)F)]$$

The multiplier effect in the initial parentheses on the right-hand side of (11) is positive. As the first term in brackets indicates, positive inflation will have the impact of increasing the inflation rate ($d\pi > 0$) through two channels. The first channel is the impact of inflation on the holding of nominal financial assets. The second is the negative impact of inflation on real wealth, *ceteris paribus*, that causes a reduction in desired assets and a decreased ability of the banking system to intermediate for a given budget deficit. Increases in desired saving or nominal interest rate reduce the growth rate of inflation, as do accumulations of forced saving. Cash shortages to the banking system fall into this category of forced saving, as noted by the inclusion of the term in $(\Delta D - \Delta D^d)$.

The expression in equation (12) yields a number of interesting conclusions. First, there is an equilibrium inflation rate in this model.

$$(13) \quad \pi^o = [(\alpha + \beta)/(\phi + (\alpha + \beta)\omega)] \{ s^* + (1-\chi)(\Delta D - \Delta D^d) + \hat{e} (c/P)F \}$$

It is, however, dependent upon maintenance of the level of cash shortage to the banking system. Second, departures from that inflation rate will lead either to acceleration or deceleration of inflation; the equilibrium is not sustainable against shocks to the system. This is evident from equation (12). Suppose that π rises; this places added upward pressure on the inflation rate, leading to an acceleration away from the equilibrium π^o . Third, elimination of the cash shortage through currency emission causes such a continuous acceleration of inflation. In equation (12), the policy of swapping currency for deposits will cause a reduction in ΔD . This policy does reduce the cash shortage, but at the cost of inflation increasing at a positive rate. The acceleration is due to the substitution away from holdings of nominal assets H and D in favor of foreign exchange F . As this "dollarization" occurs, the rate of inflation necessary to cover a given budget deficit is continuously rising.

¹² The determinants of desired saving are not explicitly modeled here. Conway (1994b) provides an explicit model of inflation and asset accumulation that examines the saving decision in a similar context.

Elimination of the cash shortage need not be inflationary. Providing more attractive incentives to households to hold deposits is an alternative route to removal of cash shortages of either kind. Consider the impact of an increase in nominal interest rates from (12). Demand for deposits will rise, and the cash shortage facing the banking system will be reduced: i.e., $(\Delta D - \Delta D^d)$ will be lessened. There will also be an increase on net in the share of wealth allocated to domestic financial assets.¹³ Both effects will lead to a reduction in the growth of inflation and to a virtuous cycle in disinflationary pressure.¹⁴

This demonstrates the third proposition. Currency emission is a solution to the problem of cash shortage, but it is a solution that leads to positive and accelerating inflation over time. More appropriate solutions will involve a shifting of the incentives to the holding of banking-system deposits; these both reduce the cash shortage and temper inflationary pressure.

V. Summary and conclusions.

Cash shortages have been endemic in the countries of the former Soviet Union. The preferred policy responses to these have been currency emission and restrictions on the convertibility of non-cash assets into cash. These policies have not achieved their goals. Currency emission has led to accelerating inflation, while the restrictions have worsened the cash shortages.

This paper demonstrates that the policies are misguided for not considering the saving and portfolio allocation choices of households, the savers in these economies. A succession of propositions indicates that

- (1) Cash shortages are manifestations of financial disintermediation;
- (2) Cash shortages are a useful tool in controlling inflationary pressures;
- (3) Currency emission to remedy a cash shortage will lead to accelerating inflation, while improving incentives to save and hold deposits will remedy the cash shortage while holding inflation in check.

The phenomenon of cash shortage is closely related to McKinnon's (1973) concept of shallow formal financial markets. This shallowness is a recent occurrence in the former Soviet Union; in the 1980s, these countries exhibited financial depth comparable to that of Western Europe. The burst of inflation in early 1992 removed the "ruble overhang" and greatly reduced all indicators of financial depth, while continuing shallowness is a direct consequence of financial disintermediation due to negative real interest rates.

Proper diagnosis of the causes of cash shortages has important policy implications. As the three propositions state, excess demands for cash are reflections of conditions throughout the financial markets. Efforts to remedy imbalances in one market without considering that the roots of the

¹³ The effects of rising interest rate on the share of wealth held in currency and deposits are of different sign: $\alpha_i < 0$, $\beta_i > 0$. However, by the adding-up constraints $\alpha_i + \beta_i = -\gamma_i > 0$.

¹⁴ Not included in this comparative-static exercise is the increase in the budget deficit due to increased interest payments. This effect would act counter to the two "virtuous" effects cited in the text. Conway (1994b) discusses the dynamic implications of this effect.

imbalance are found in another financial market will founder on the integration of financial markets and the substitutability of these assets in household portfolios.

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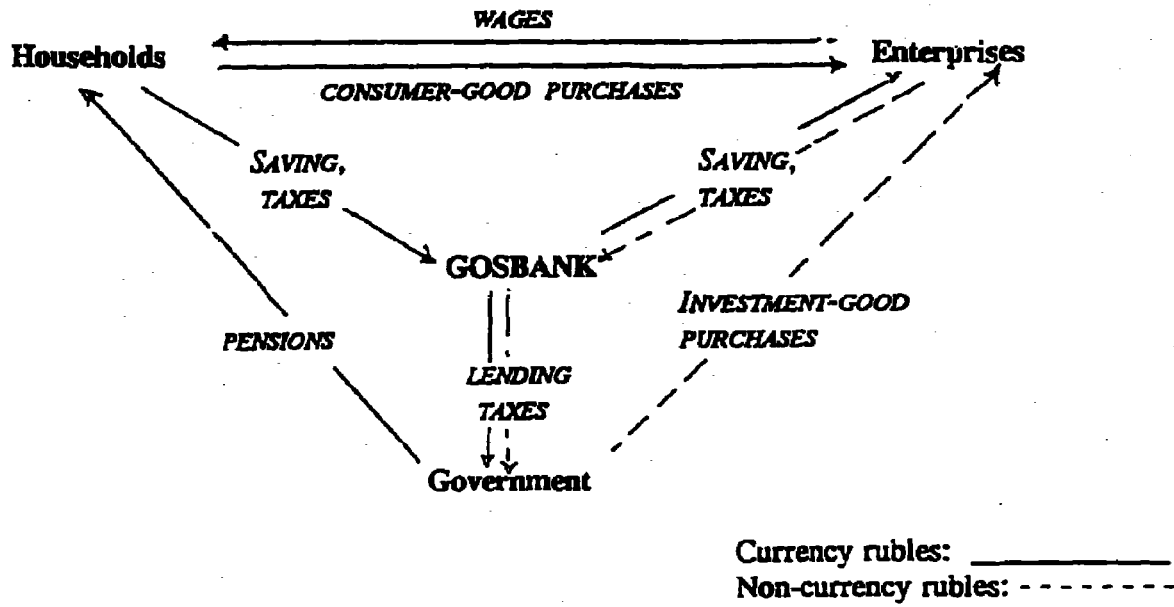


Figure 1
Flow of Funds in Economy

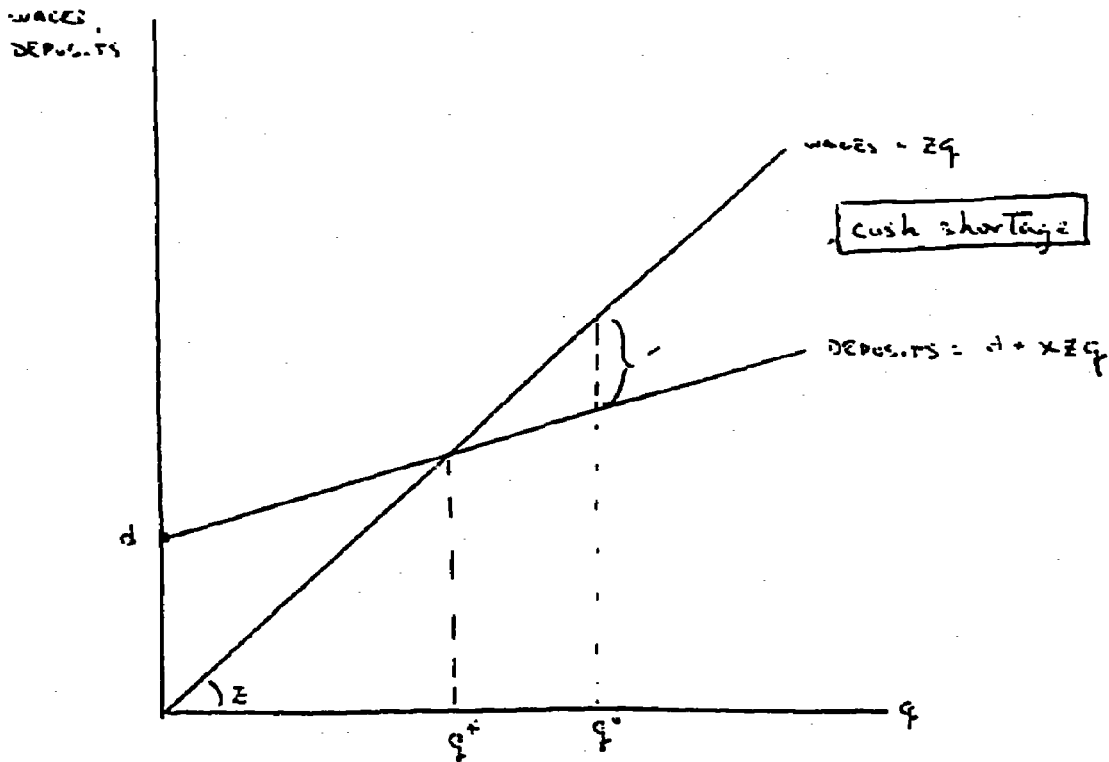


Figure 2
Cash Flow Equilibrium

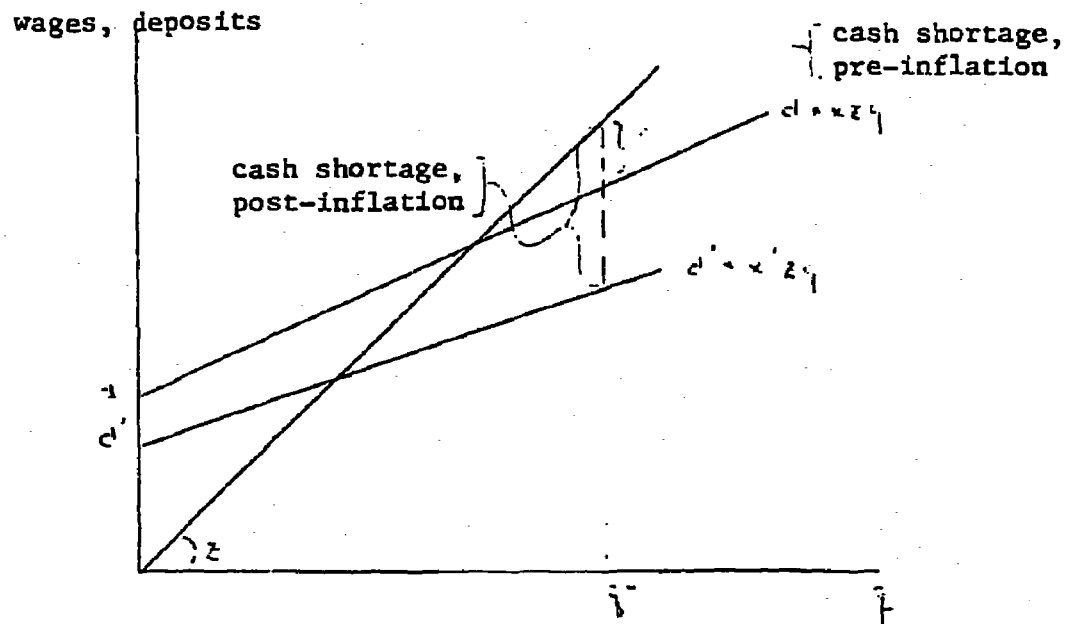


Figure 3
The Impact of Inflation on the Cash Flow Equilibrium

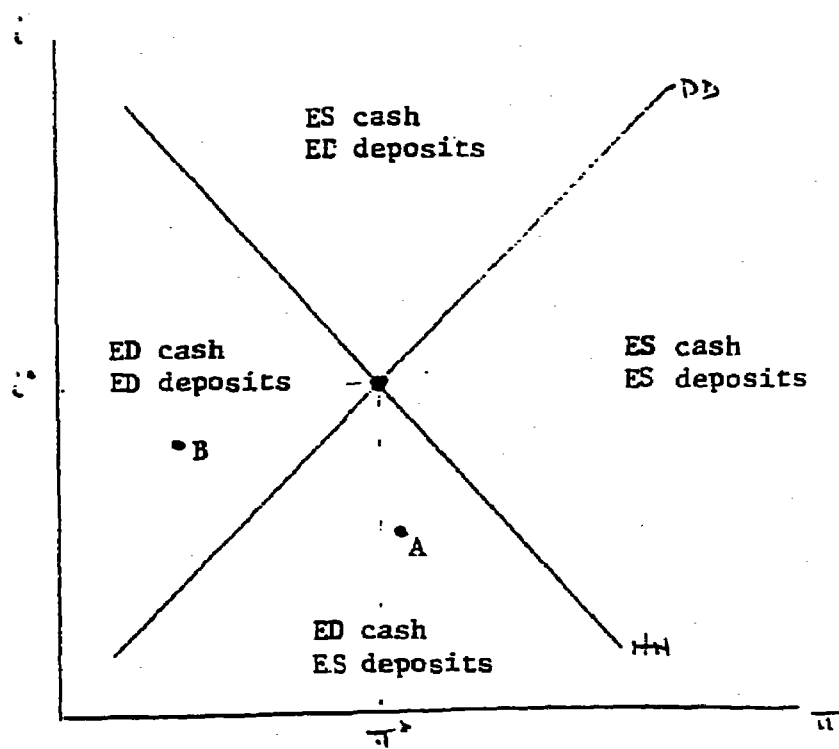


Figure 4
Excess Demands in Financial Markets

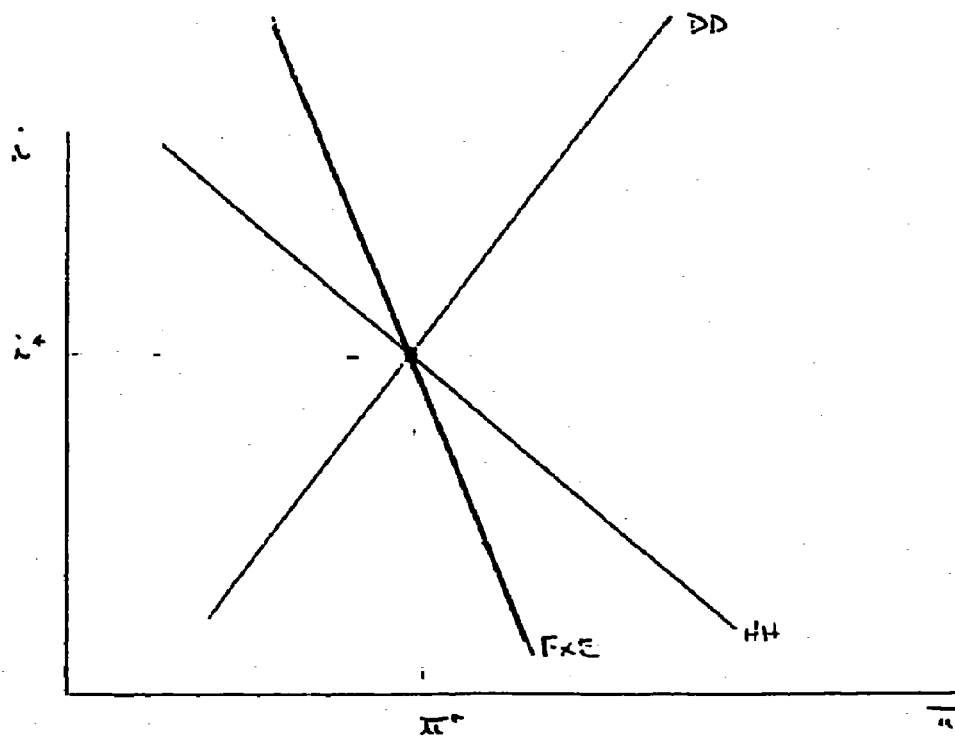


Figure 5
Cash Shortage with a Liberalized Foreign Exchange Market

Table 1
Chronology of Currency Shortages: Selected Republics

Country	Period	Source and magnitude of shortage
Belarus	May 1992	4 billion rubles; wage arrears.
	March 1993	ruble shortage; currency flight.
	May/July 1993	reported wage arrears
Estonia	March 1992	ruble shortage requires sale of hard currency reserves.
Georgia	May/December 1992	severe arrears on wage and pension payments.
	January/April 1993	4 months of wage and pension arrears, and widespread efforts of consumers to purchase on account for lack of rubles. (60-80 percent of potential purchasers)
Kazakhstan	February/March 1992	Ruble shortages lead to Cabinet of Ministers edits 148 and 300, limiting withdrawals of currency from bank accounts.
	May/August 1992	wage and benefit arrears building from 6 billion to 15.4 billion rubles.
	May/September 1993	Ruble shortfall; many firms in July were in "pre-strike" situation due to wage arrears. "New" Russian rubles not yet accepted as legal tender, despite entry into circulation through trade with Russia.
Lithuania	February 1992	monthly salaries not paid to government officials (including Prime Minister)
	May 1992	3 billion rubles in wage and pension arrears.
	May/June 1993	talonas shortfall; in part due to the withdrawal of counterfeitable banknotes from circulation.
Russia	December 1991 /January 1991	CBR short 12 billion rubles. Russian Supreme Soviet places restrictions on currency use and withdrawals.
	May 1992	2 trillion rubles in wage and benefits arrears
	June 1992	Kuzbass workers and trade union FNPR threaten strike over non-payment of wages.
Ukraine	January 1992	Ruble shortage equal to 25 percent of wage payments leads to introduction of coupon.
	June/August 1993	Wide-spread currency shortages lead to restrictions on currency withdrawal and use.

Sources: data collection network and news accounts. Individual months indicate a news account, while ranges indicate a series of accounts or reports from data collectors begun in 1993.

Table 2

Premium of Currency over Accounting Credits in Foreign-Exchange Markets

Country	Period	Foreign Exchange Price Ratio: Currency/Accounting Credit
Belarus	12 June 1993	1.80
	15 August 1993	2.52
	3 November 1993	6.10
Georgia	1 April 1993	7.69
	18 June 1993	2.21
	4 October 1993	2.54
Kazakhstan	16 June 1992	1.35
	15 December 1992	1.15
	20 May 1993	1.34
	24 August 1993	1.37

Source: data collection network.

Table 3

Interest Rates on Saving and Lending
 Nominal annual rates in 1993, domestic currency accounts

	Belarus	Georgia	Kazakhstan	Lithuania	Russia	Ukraine
	17 July	1 July	1 July	10 June	14 June	1 July
Saving Bank Deposits:						
Sight	20	5	15		140	80
Less than 1 year				60-75		
1-3 year	40	15	30			
3-5 year	50	20	40			
more than 5 years	60	25	60			
Loans:						
refinance credits	140	20 ?	25		140	240
1 year commercial loan	200	65	200	60-160	200	280
Memo:						
Monthly inflation rate	30.5	40.0	30-40	12.7-0.9	19	21.3
Credit auction rate	200		163-177	160-175	161-168	

Note: (1) Sberbank deposits in Russia were recorded in Saratov. Commercial bank was Promstro Bank for Belarus and Georgia, Kazcommercebank for Kazakhstan, Electronbank of Lvov for Ukraine, and Sberbank of Saratov for Russia.

(2) In Lithuania, deposit rates vary by number of months of obligation and size of deposit. Lending rates differ by source: 60.5 percent for central bank credits, 60-90 percent for household credits, 160 percent for enterprise credits.

(3) Monthly inflation rates are taken for the last available month before the observed interest rate. That is May in Georgia, Lithuania, Russia and Ukraine, and June for Belarus. In Lithuania I also report the much lower rate for August, expectations of which may have been incorporated in the deposit and loan rates.

Sources: Saving Bank-successor agencies in each republic, reports from correspondents, news reports.

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